Louisiana's Uninsured Population:
December 2009 Parish-level Forecast

A Report from the 2009 Louisiana Health Insurance Survey

Stephen Barnes, Assistant Professor-Research
Division of Economic Development
Department of Economics
EJ Ourso College of Business
Louisiana State University

Kirby Goidel, Professor
Director of Public Policy Research
Reilly Center for Media & Public Affairs
Manship School of Mass Communication
Louisiana State University

Dek Terrell, Freeport-McMoran Professor
Director Division of Economic Development
Department of Economics
E.J. Ourso College of Business
Louisiana State University

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The Public Policy Research Lab
Reilly Center for Media & Public Affairs
Manship School of Mass Communication
Louisiana State University

Division of Economic Development
E. J. Ourso College of Business
Louisiana State University

The Louisiana Health Insurance Survey (LHIS) represents the most comprehensive data collection effort in assessing health insurance coverage in Louisiana. The survey has been conducted every two years since 2003 with analysis from the 2009 LHIS providing the most recent estimates of insurance coverage in the state. As summarized in the 2009 LHIS Report, overall uninsured rates at the time of the survey had fallen slightly for both children and adults relative to estimates from the 2007 LHIS. Statewide, approximately 5 percent of children and 20 percent of adults were uninsured. Estimates of the percent of adults and children who are uninsured in each parish at the time of the survey were published in a separate report in February, 2010. Since the survey was conducted, the state's economy has become more notably affected by the national recession. Consequently, the likelihood of being uninsured has increased for Louisiana residents. The purpose of this report is to present updated uninsured rates for children and adults in each of Louisiana's 64 parishes for the forecast period December, 2009.

Parish-level forecasts provide timely estimates of insurance status throughout the state using updated data on the socioeconomic profile of each parish. Since publication of the parish-level estimates for the LHIS survey, the economic conditions in the state have worsened. However, those changes have not been spread evenly throughout the state. Those changes are captured through the model by using updated data on school lunch enrollment, updated unemployment rates for each parish, and updated Medicaid enrollment. Since the previous estimates, the U.S. Census has also released updated population estimates for parishes, which have been incorporated. In addition to employing updated input data, the model itself has been updated by adding data from previous LHIS surveys to the 2009 data including additional controls to account for changing economic conditions over time. The extension to multiple years of LHIS data allows the underlying relationships between socioeconomic characteristics and insurance coverage to be measured more accurately. Finally, because the direct estimates from the 2009 LHIS are not as timely, greater weight was given to the estimates from the model.

The December 2009 forecast of parish-level uninsured rates are compared to past estimates in Appendix A to demonstrate trends in uninsured rates for each parish over time. These parish-level estimates help measure the success of past efforts to reduce the uninsured rate in Louisiana localities and are intended to provide better guidance to DHH in determining target areas for future Medicaid/LaCHIP outreach and enrollment. The estimates can also inform state and local decision making regarding providing care to the uninsured.

As with estimates from previous years of the LHIS, the forecasting model used for December 2009 benefits from continued methodological improvements. Parish-level estimates from the 2005 LHIS introduced a statistical method that "borrows" information from other data sources and other parts of the state to improve estimates when the sample size is small. Specifically, the small area estimation technique blended the estimates derived directly from the sample individuals with a synthetic estimate based on characteristics of the parish such as the unemployment rate and average income. The 2007 LHIS also used small area estimation and incorporated an individual-level adjustment for Medicaid underreporting, as described in the 2007 LHIS Report.

The methodology used for the 2009 LHIS parish-level estimates continued to use a similar small area estimation technique and individual-level adjustments for Medicaid underreporting. However, additional work was done to assess and improve the models for developing synthetic estimates in order to provide a better basis for future forecasts. This assessment and subsequent changes are described in detail

in the February 2010 report. The forecasting model for December 2009 extends this model to include multiple years of the LHIS. This extension allows for more well-defined relationships between the socioeconomic profile of a parish and the proportion of residents without insurance.

The figures and tables below present the December 2009 forecast of uninsured rates by parish as well as some of the key underlying data upon which those estimates are based. Figure 1 illustrates the relative magnitude of the uninsured rates across parishes for children. Because of the elapsed time since the survey, the December 2009 forecast places greater emphasis on the model-based synthetic estimates relative to the direct estimates from the individuals sampled during the summer of 2009. Jefferson Davis Parish has the highest uninsured rate for children at 9.1 percent. This is driven by a high uninsured rate among sample individuals from the parish at 11.1 percent. However, the relatively small sample size in that parish led to a notable decrease when averaging in the synthetic estimate based on other characteristics of the parish, such as Medicaid enrollment and the unemployment rate, which imply that the parish has a lower uninsured rate. West Carroll Parish has the lowest estimated uninsured rate for children at 2.4 percent. As with Jefferson Davis, this estimate is driven by a low reported uninsured rate among sample respondents within the parish at 1.6 percent. However, the synthetic estimates increase the final estimate. While West Carroll Parish is a lower-income parish with relatively high unemployment, Medicaid and LaCHIP play a significant role in extending coverage thereby keeping the uninsured rate low.

Figure 2 illustrates the relative magnitude of the uninsured rates across parishes for adults. As with the previous estimates, East Carroll Parish has the highest uninsured rate for adults, which declined only slightly from 41.4 to 41.2 percent. It should be noted that there is a large margin of error on this estimate due to the small sample size. For this parish, while the direct estimate was only 35.0 percent, the characteristics of the parish imply a higher uninsured rate and blending in the synthetic estimate increases the final estimate. St. Tammany Parish has the lowest uninsured rate for adults at 11.6 percent. Notably, St. Tammany has one of the lowest direct estimates and characteristics that also imply a low uninsured rate for the parish, which is captured by the synthetic estimate.

Generally speaking, uninsured rates continue to be slightly higher in central and north Louisiana than south Louisiana. With regard to some of the largest parishes in the state, East Baton Rouge Parish has an uninsured rate among children of 4.9 percent and among the non-elderly adult population of 16.9 percent, while the Jefferson and Orleans Parishes have slightly higher uninsured rates. Orleans Parish has an estimated 8.7 percent of children uninsured and 22.5 percent of adults uninsured. Jefferson Parish has an estimated 6.2 percent of children uninsured and 17.9 percent of adults uninsured. In general, the estimated uninsured rates are higher than the previous estimates due to worsening economic conditions between July and December 2009.

The remainder of this document summarizes the parish-level study in greater detail, beginning with a more detailed description of how statistical models were used to obtain more precise estimates, particularly in parishes with small sample sizes.

Figure 1: December 2009 Forecasted Uninsured Rates for Children (under 19) by Parish

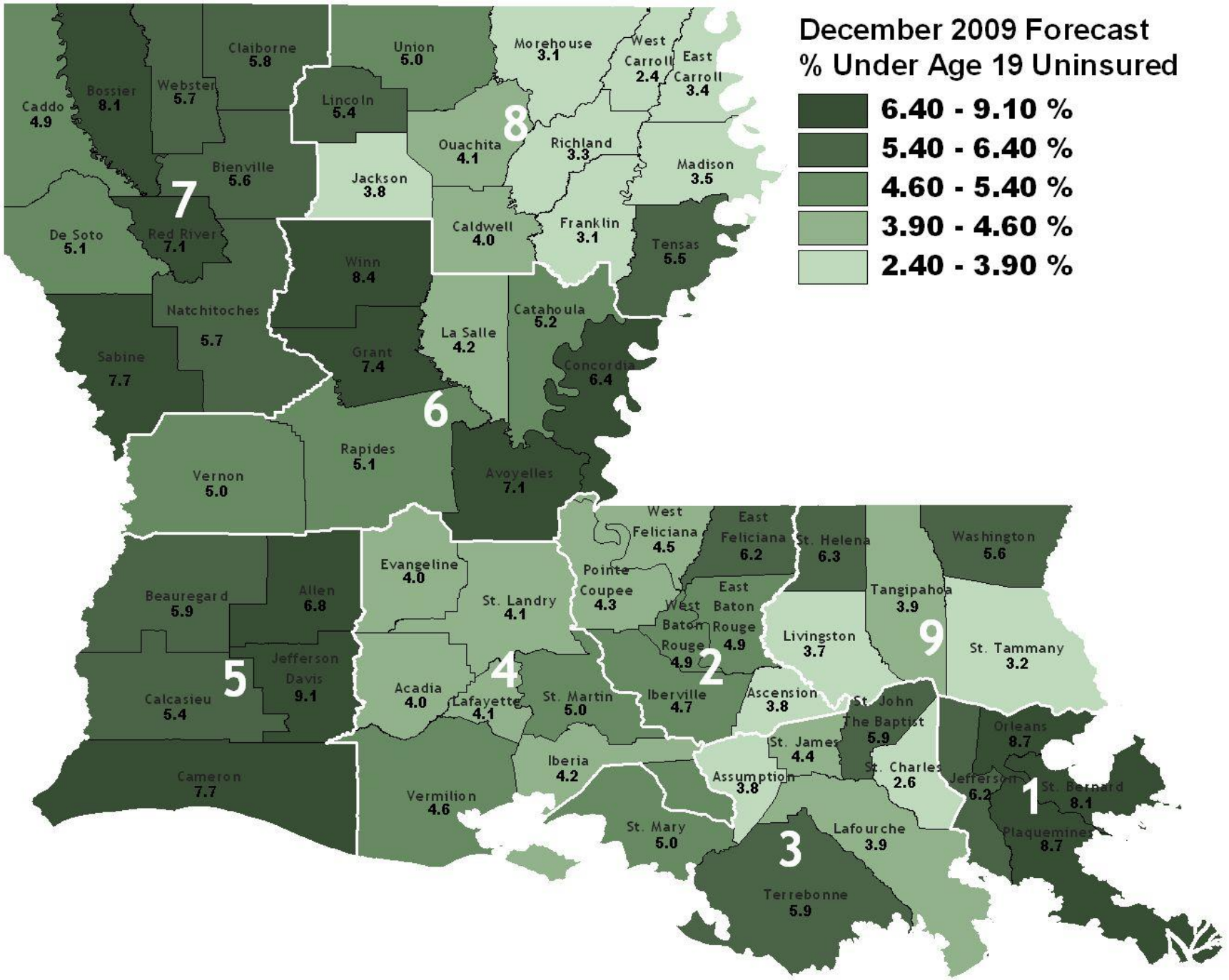
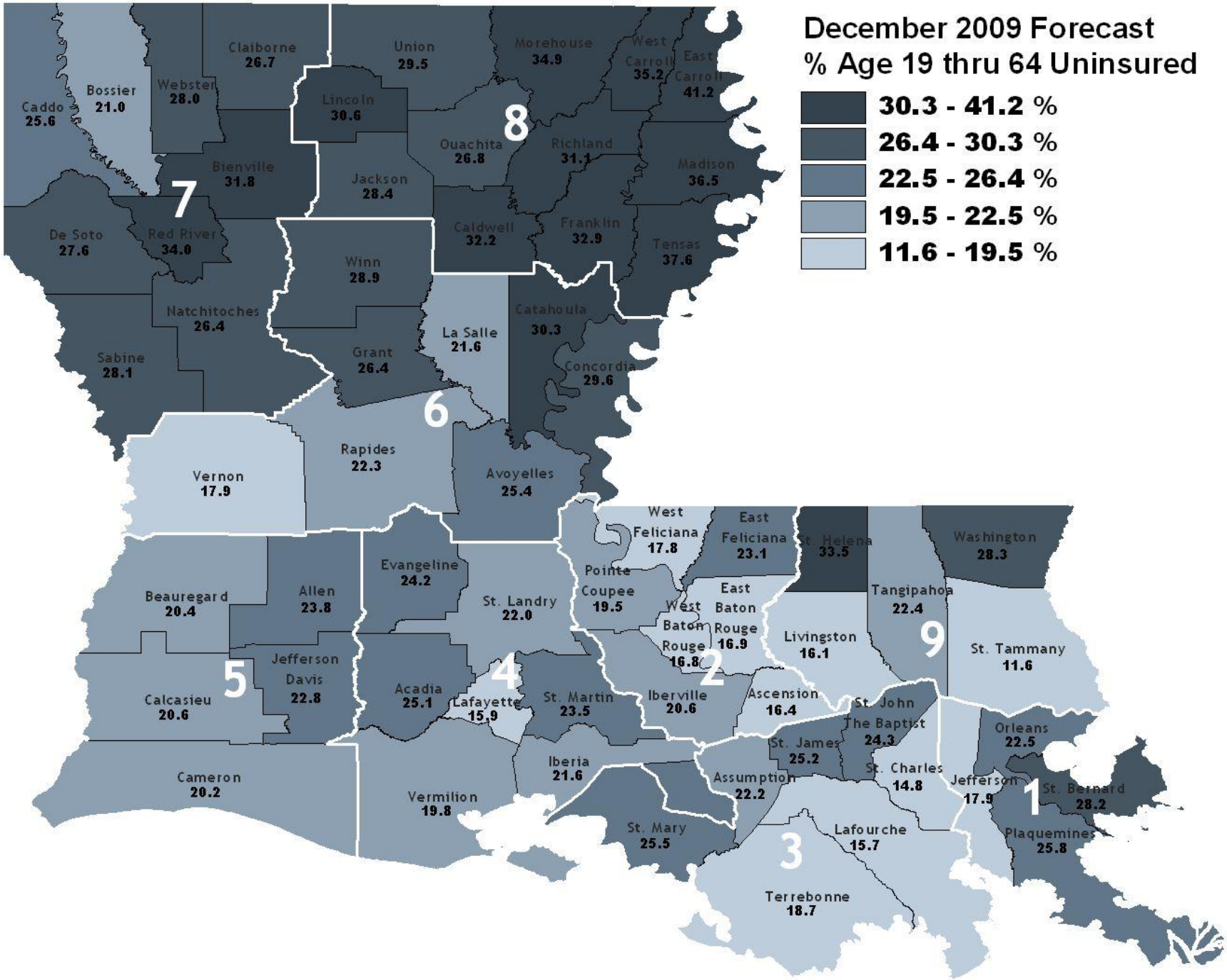


Figure 2: December 2009 Forecasted Uninsured Rates for Adults (Age 19 through 64) by Parish



I. Methodology

The purpose of this section is to describe the methodology used to forecast parish-level uninsured rates based on the 2009 LHIS. Discussion of small area estimation, sample size, and parish and regional level estimates are included in this section. Small area estimation provides more precise estimates of the percent of uninsured citizens in a parish based on the fact that parishes which are similar in other attributes are also likely to have similar rates of insurance coverage.

Small Area Estimation

Various methods of small area estimation exist, and while each does provide insight into the study of health policy, different techniques offer different strengths and weaknesses. The various methods include:

- Direct survey estimation
- Synthetic estimation
- Blended estimation

The simplest method is direct survey estimation, which simply uses the survey to estimate the proportion of uninsured children or adults in each parish. The synthetic estimation method consists of constructing estimates by building a statistical model to predict uninsured rates at the parish level. In essence, the statistical model takes advantage of the fact that we would expect parishes that are similar in terms of other characteristics (income, Medicaid enrollment, etc.) to have similar insurance coverage rates. Finally, this blended estimation option, called information borrowing, allows us to blend the survey estimates with synthetic estimates. The blended estimates place greater weight on the direct survey estimates in parishes where a large sample exists and rely more heavily on synthetic estimates in parishes where the sample size is small. In the context of forecasting, the blended estimates place less emphasis on direct estimates and greater emphasis on synthetic estimates as the forecast horizon grows and the original estimates become less timely. A technical discussion of the statistical methodology is included in Appendix B.

Sample Size

Like the 2005 and 2007 rounds of the LHIS, the 2009 LHIS sampling design was created with the intent to produce parish-level estimates. Specifically, the random sample was created with the intent of contacting 65 households in each parish. Additional households were allocated to ensure adequate sample sizes for regions. An additional poverty oversample was added to ensure adequate responses for statistical analyses among this population of interest. Because not all households contain children, the number of children covered by this survey methodology may be lower than 65 in some cases, but the number of adults in each parish is likely to be quite a bit higher given that many households contain multiple adults.

The final, or blended, estimates are weighted averages of the direct and synthetic estimates. The weights are based on the estimated accuracy of direct estimates relative to the synthetic estimates, which depends in large part on the sample size in the parish. For example, a direct estimate from a parish with a

larger sample size will be given more weight relative to the synthetic estimate than the direct estimate from a parish with a small sample size. In addition, the weights are adjusted when producing forecasts to account for the fact that the direct estimates are less timely for estimating uninsured rates in future periods such as December 2009 than they were in the initial round of estimates for the time period of the survey. Table 1 summarizes the direct estimates for children and adults, which are based only on the individuals sampled in the 2009 LHIS. The table also shows the sample size and margin of error for each estimate, which are two measures that indicate how accurate each estimate is. With a sample of 1,128 adults 19-64 years of age, the margin of error for the East Baton Rouge Parish direct estimate is only 2.3% indicating a relatively high degree of accuracy. The margin of error for the East Carroll Parish direct estimate, based on 80 adults, is 8.8%. Furthermore, estimates for children in that parish are based on a sample of only 25 children under 19 and may offer relatively low accuracy.

Parish and Regional Estimates

After developing synthetic estimates and averaging those with the direct estimates, a scaling or "raking" stage was incorporated to produce the final estimates. This step ensures that the parish-level estimates are consistent with regional estimates produced previously. Specifically, the scaling factors used to align parish estimates with regional estimates from the initial parish estimates were used to scale the December 2009 forecast in a similar fashion. Table 2 contains the final blended estimates for children under 19 and adults aged 19 thru 64.

Data Utilized

As new data become available, the models can be run again to produce forecasts of uninsured rates in other time periods. The parish-level data used to produce the results found in this report came from the following sources:

1. 2009 LHIS survey
2. December 2009 unemployment data by parish
3. February 2010 free & reduced school lunch enrollment
4. July 2008 Census population characteristics by parish (age group, gender, and race)
5. July 2009 Census population totals by parish
6. December 2009 Medicaid enrollment
7. 2007 average annual gross income from the IRS

II. Discussion

This report contains detailed Louisiana parish-level estimates of the proportion of the population that is uninsured for both those under 19 and those between 19 and 64 for the forecast period December 2009. While the uninsured rate as measured by the 2009 LHIS had fallen statewide relative to previous

years, economic conditions in the state worsened in the latter part of the year. The December 2009 forecasted parish-level uninsured rates reveal that this resulted in a trend of increasing uninsured rates. For kids, the effect was very small due to the mitigating effect of Medicaid and LaCHIP. For adults, the effect was more noticeable. However, that pattern was not uniform, and the December 2009 forecast shows a more optimistic outlook of declining rates for some of the parishes with high estimated uninsured rates from the 2009 LHIS time period. This is attributable to larger weights given to the synthetic estimates relative to the direct estimates due to the passage of time between data collection and the forecast horizon. The LaCHIP and Medicaid programs continue to be a great equalizing factor in keeping uninsured rates more similar for children than what is seen for adults. The parish-level estimates for children and adults are shown in Table 3 with the estimated number of uninsured individuals based on the most recent Census data available from July 2009.

Not surprisingly, the results indicate that insurance coverage rates are highly correlated with parish income for those 19 to 64. While the state as a whole has been somewhat insulated from the national recession, declining economic conditions in the latter part of 2009 resulted in increased uninsured rates for some parishes For example, the unemployment rate in St. John the Baptist Parish went up from 8.3 percent in July 2009 to 9.3 percent in December 2009. Over the same time period, the estimated uninsured rate for adults rose from 22.0 percent to 24.3 percent in the parish. For children, the uninsured rate rose only slightly from 5.6 to 5.9, thanks in part to increasing Medicaid/LaCHIP enrollment.

The good news is that significant economic development projects have been announced over the past year in some of the hardest hit parishes offering hope for new jobs and associated increases in insurance coverage. Moreover, targeted efforts to increase enrollment in Medicaid and LaCHIP should further reduce disparities in insurance coverage moving forward.

Table 1: 2009 Survey Estimates of the Uninsured

		Children (Under 19)			Adults (19-64)		
Parish	**Region**	**Number Surveyed**	**Percent Uninsured**	**Margin of Error**	**Number Surveyed**	**Percent Uninsured**	**Margin of Error**
Jefferson	1	523	3.9%	1.9%	1360	15.1%	2.1%
Orleans	1	323	6.7%	2.4%	883	18.5%	2.6%
Plaquemines	1	74	7.2%	5.0%	140	23.6%	6.6%
St. Bernard	1	42	3.2%	6.6%	126	25.7%	7.0%
Ascension	2	139	3.1%	3.6%	226	14.3%	5.2%
East Baton Rouge	2	509	4.6%	1.9%	1128	15.9%	2.3%
East Feliciana	2	80	4.9%	4.8%	193	18.7%	5.6%
Iberville	2	79	2.5%	4.8%	211	13.2%	5.4%
Pointe Coupee	2	49	0.0%	6.1%	134	10.1%	6.8%
West Baton Rouge	2	102	3.9%	4.2%	231	10.4%	5.2%
West Feliciana	2	53	7.4%	5.9%	126	11.5%	7.0%
Assumption	3	92	2.5%	4.5%	218	18.1%	5.3%
Lafourche	3	173	3.4%	3.2%	426	12.0%	3.8%
St. Charles	3	133	0.4%	3.7%	316	9.6%	4.4%
St. James	3	29	3.4%	7.9%	91	19.1%	8.2%
St. John The Baptist	3	92	5.0%	4.5%	199	17.8%	5.6%
St. Mary	3	126	7.0%	3.8%	253	24.2%	4.9%
Terrebonne	3	216	7.0%	2.9%	502	16.3%	3.5%
Acadia	4	132	3.3%	3.7%	306	22.6%	4.5%
Evangeline	4	100	2.0%	4.3%	217	16.8%	5.3%
Iberia	4	170	3.7%	3.3%	360	16.6%	4.1%
Lafayette	4	340	3.1%	2.3%	664	12.6%	3.0%
St. Landry	4	151	2.9%	3.5%	326	15.3%	4.3%
St. Martin	4	125	5.7%	3.8%	307	19.0%	4.5%
Vermilion	4	111	5.4%	4.1%	275	14.2%	4.7%
Allen	5	99	6.0%	4.3%	206	16.3%	5.5%
Beauregard	5	87	4.1%	4.6%	253	15.1%	4.9%
Calcasieu	5	460	4.0%	2.0%	954	19.2%	2.5%
Cameron	5	65	5.4%	5.3%	122	13.4%	7.1%
Jefferson Davis	5	97	11.1%	4.3%	241	18.9%	5.1%
Avoyelles	6	117	7.2%	3.9%	272	19.4%	4.8%
Catahoula	6	45	3.0%	6.4%	146	27.4%	6.5%
Concordia	6	94	8.1%	4.4%	189	25.6%	5.7%
Grant	6	70	10.0%	5.1%	176	23.1%	5.9%
La Salle	6	94	2.1%	4.4%	240	16.5%	5.1%
Rapides	6	274	3.9%	2.6%	597	19.4%	3.2%
Vernon	6	135	1.9%	3.7%	237	7.2%	5.1%
Winn	6	56	16.0%	5.7%	172	25.5%	6.0%

Table 1 (continued): 2009 Survey Estimates of the Uninsured

		Children (Under 19)			Adults (19-64)		
Parish	**Region**	**Number Surveyed**	**Percent Uninsured**	**Margin of Error**	**Number Surveyed**	**Percent Uninsured**	**Margin of Error**
Bienville	7	81	4.7%	4.7%	170	28.9%	6.0%
Bossier	7	184	9.6%	3.1%	344	16.3%	4.2%
Caddo	7	327	3.9%	2.4%	670	22.4%	3.0%
Claiborne	7	56	3.5%	5.7%	172	15.0%	6.0%
De Soto	7	75	2.1%	4.9%	176	20.8%	5.9%
Natchitoches	7	115	4.0%	4.0%	241	18.7%	5.1%
Red River	7	53	5.7%	5.9%	132	29.3%	6.8%
Sabine	7	55	10.4%	5.8%	145	22.0%	6.5%
Webster	7	111	6.6%	4.1%	267	24.5%	4.8%
Caldwell	8	70	5.7%	5.1%	186	27.9%	5.7%
East Carroll	8	25	0.0%	8.5%	80	35.0%	8.8%
Franklin	8	51	1.0%	6.0%	159	25.1%	6.2%
Jackson	8	70	4.3%	5.1%	148	20.9%	6.4%
Lincoln	8	76	9.1%	4.9%	197	26.1%	5.6%
Madison	8	46	0.0%	6.3%	130	29.0%	6.9%
Morehouse	8	81	2.2%	4.7%	156	28.1%	6.3%
Ouachita	8	169	5.3%	3.3%	321	21.1%	4.4%
Richland	8	69	2.1%	5.1%	195	23.6%	5.6%
Tensas	8	17	16.3%	10.4%	67	25.3%	9.6%
Union	8	62	6.4%	5.4%	158	19.3%	6.2%
West Carroll	8	33	1.6%	7.4%	114	29.8%	7.3%
Livingston	9	255	3.5%	2.7%	486	11.7%	3.6%
St. Helena	9	34	2.2%	7.3%	96	27.5%	8.0%
St. Tammany	9	464	2.5%	2.0%	977	8.7%	2.5%
Tangipahoa	9	280	3.2%	2.6%	547	18.3%	3.4%
Washington	9	135	5.1%	3.7%	308	23.8%	4.5%

Table 2: December 2009 Forecast—Blended Estimates of the Uninsured and Margins of Error

		Children (Under 19)		Adults (19-64)	
Parish	Region	Percent Uninsured	Margin of Error	Percent Uninsured	Margin of Error
Jefferson	1	6.2%	1.6%	17.9%	2.1%
Orleans	1	8.7%	2.0%	22.5%	2.5%
Plaquemines	1	8.7%	2.7%	25.8%	4.2%
St. Bernard	1	8.1%	2.9%	28.2%	4.0%
Ascension	2	3.8%	2.3%	16.4%	3.8%
East Baton Rouge	2	4.9%	1.6%	16.9%	2.3%
East Feliciana	2	6.2%	2.6%	23.1%	4.1%
Iberville	2	4.7%	2.6%	20.6%	4.0%
Pointe Coupee	2	4.3%	2.7%	19.5%	4.3%
West Baton Rouge	2	4.9%	2.5%	16.8%	3.8%
West Feliciana	2	4.5%	2.7%	17.8%	4.4%
Assumption	3	3.8%	2.7%	22.2%	3.8%
Lafourche	3	3.9%	2.4%	15.7%	3.2%
St. Charles	3	2.6%	2.5%	14.8%	3.5%
St. James	3	4.4%	3.2%	25.2%	4.7%
St. John The Baptist	3	5.9%	2.8%	24.3%	4.2%
St. Mary	3	5.0%	2.6%	25.5%	3.8%
Terrebonne	3	5.9%	2.2%	18.7%	3.1%
Acadia	4	4.0%	2.4%	25.1%	3.5%
Evangeline	4	4.0%	2.5%	24.2%	3.8%
Iberia	4	4.2%	2.3%	21.6%	3.4%
Lafayette	4	4.1%	1.9%	15.9%	2.8%
St. Landry	4	4.1%	2.3%	22.0%	3.4%
St. Martin	4	5.0%	2.4%	23.5%	3.5%
Vermilion	4	4.6%	2.5%	19.8%	3.5%
Allen	5	6.8%	2.8%	23.8%	4.0%
Beauregard	5	5.9%	2.9%	20.4%	3.7%
Calcasieu	5	5.4%	1.8%	20.6%	2.4%
Cameron	5	7.7%	3.1%	20.2%	4.5%
Jefferson Davis	5	9.1%	2.8%	22.8%	3.8%
Avoyelles	6	7.1%	2.7%	25.4%	3.7%
Catahoula	6	5.2%	3.1%	30.3%	4.2%
Concordia	6	6.4%	2.8%	29.6%	4.0%
Grant	6	7.4%	2.9%	26.4%	4.0%
La Salle	6	4.2%	2.8%	21.6%	3.8%
Rapides	6	5.1%	2.1%	22.3%	2.9%
Vernon	6	5.0%	2.6%	17.9%	3.7%
Winn	6	8.4%	3.0%	28.9%	4.1%

Table 2 (continued): December 2009 Forecast—Blended Estimates of the Uninsured and Margins of Error

		Children (Under 19)		Adults (19-64)	
Parish	**Region**	**Percent Uninsured**	**Margin of Error**	**Percent Uninsured**	**Margin of Error**
Bienville	7	5.6%	2.6%	31.8%	3.9%
Bossier	7	8.1%	2.3%	21.0%	3.3%
Caddo	7	4.9%	1.9%	25.6%	2.7%
Claiborne	7	5.8%	2.8%	26.7%	4.0%
De Soto	7	5.1%	2.7%	27.6%	3.9%
Natchitoches	7	5.7%	2.5%	26.4%	3.7%
Red River	7	7.1%	2.8%	34.0%	4.2%
Sabine	7	7.7%	2.8%	28.1%	4.2%
Webster	7	5.7%	2.5%	28.0%	3.5%
Caldwell	8	4.0%	2.8%	32.2%	3.9%
East Carroll	8	3.4%	3.2%	41.2%	4.6%
Franklin	8	3.1%	2.9%	32.9%	4.0%
Jackson	8	3.8%	2.8%	28.4%	4.0%
Lincoln	8	5.4%	2.7%	30.6%	3.9%
Madison	8	3.5%	3.0%	36.5%	4.1%
Morehouse	8	3.1%	2.7%	34.9%	4.0%
Ouachita	8	4.1%	2.3%	26.8%	3.4%
Richland	8	3.3%	2.8%	31.1%	3.9%
Tensas	8	5.5%	3.2%	37.6%	4.7%
Union	8	5.0%	2.8%	29.5%	4.1%
West Carroll	8	2.4%	3.0%	35.2%	4.3%
Livingston	9	3.7%	2.0%	16.1%	3.0%
St. Helena	9	6.3%	2.9%	33.5%	4.5%
St. Tammany	9	3.2%	1.7%	11.6%	2.3%
Tangipahoa	9	3.9%	2.0%	22.4%	2.9%
Washington	9	5.6%	2.4%	28.3%	3.4%

Table 3: December 2009 Forecast—Estimated Number of Uninsured Individuals

		Children (Under 19)			Adults (19-64)		
Parish	**Region**	**Estimated July 2009 Population**	**2009 Percent Uninsured**	**Estimated Number Uninsured**	**Estimated July 2009 Population**	**2009 Percent Uninsured**	**Estimated Number Uninsured**
Jefferson	1	110,645	6.2%	6,907	272,109	17.9%	57,181
Orleans	1	82,138	8.7%	7,176	229,082	22.5%	51,479
Plaquemines	1	5,802	8.7%	504	12,812	25.8%	3,304
St. Bernard	1	9,054	8.1%	730	28,019	28.2%	7,909
Ascension	2	31,334	3.8%	1,182	64,891	16.4%	10,664
East Baton Rouge	2	118,781	4.9%	5,831	269,784	16.9%	45,551
East Feliciana	2	4,997	6.2%	309	13,379	23.1%	3,092
Iberville	2	8,191	4.7%	384	20,589	20.6%	4,240
Pointe Coupee	2	5,668	4.3%	244	13,470	19.5%	2,621
West Baton Rouge	2	6,085	4.9%	299	14,152	16.8%	2,383
West Feliciana	2	2,498	4.5%	113	11,278	17.8%	2,005
Assumption	3	5,775	3.8%	217	14,315	22.2%	3,171
Lafourche	3	24,289	3.9%	951	58,170	15.7%	9,128
St. Charles	3	14,121	2.6%	362	32,430	14.8%	4,788
St. James	3	5,699	4.4%	252	12,692	25.2%	3,199
St. John The Baptist	3	14,091	5.9%	833	28,964	24.3%	7,035
St. Mary	3	13,914	5.0%	689	30,042	25.5%	7,662
Terrebonne	3	30,666	5.9%	1,798	66,804	18.7%	12,502
Acadia	4	17,324	4.0%	692	35,178	25.1%	8,831
Evangeline	4	10,043	4.0%	401	20,758	24.2%	5,028
Iberia	4	21,318	4.2%	887	44,547	21.6%	9,609
Lafayette	4	57,949	4.1%	2,357	131,473	15.9%	20,882
St. Landry	4	26,121	4.1%	1,067	53,138	22.0%	11,695
St. Martin	4	14,315	5.0%	714	32,200	23.5%	7,561
Vermilion	4	15,008	4.6%	695	33,610	19.8%	6,640

Table 3 (continued): December 2009 Forecast—Estimated Number of Uninsured Individuals

		Children (Under 19)			Adults (19-64)		
Parish	Region	Estimated July 2009 Population	2009 Percent Uninsured	Estimated Number Uninsured	Estimated July 2009 Population	2009 Percent Uninsured	Estimated Number Uninsured
Allen	5	6,216	6.8%	422	16,237	23.8%	3,871
Beauregard	5	9,378	5.9%	554	21,592	20.4%	4,410
Calcasieu	5	50,681	5.4%	2,719	113,384	20.6%	23,387
Cameron	5	1,449	7.7%	111	4,358	20.2%	880
Jefferson Davis	5	8,568	9.1%	778	18,072	22.8%	4,128
Avoyelles	6	11,181	7.1%	790	25,674	25.4%	6,520
Catahoula	6	2,593	5.2%	136	6,355	30.3%	1,926
Concordia	6	4,957	6.4%	318	11,013	29.6%	3,264
Grant	6	5,370	7.4%	400	12,174	26.4%	3,211
La Salle	6	3,494	4.2%	146	8,314	21.6%	1,792
Rapides	6	35,984	5.1%	1,837	79,668	22.3%	17,761
Vernon	6	15,515	5.0%	773	26,196	17.9%	4,702
Winn	6	3,554	8.4%	297	9,542	28.9%	2,759
Bienville	7	3,629	5.6%	205	8,461	31.8%	2,693
Bossier	7	31,842	8.1%	2,574	66,560	21.0%	13,987
Caddo	7	67,755	4.9%	3,309	150,890	25.6%	38,584
Claiborne	7	3,558	5.8%	205	9,917	26.7%	2,646
De Soto	7	6,989	5.1%	354	15,787	27.6%	4,362
Natchitoches	7	11,175	5.7%	636	23,177	26.4%	6,120
Red River	7	2,518	7.1%	179	5,134	34.0%	1,748
Sabine	7	6,214	7.7%	479	13,700	28.1%	3,851
Webster	7	9,873	5.7%	565	23,698	28.0%	6,643

Table 3 (continued): December 2009 Forecast—Estimated Number of Uninsured Individuals

		Children (Under 19)			Adults (19-64)		
Parish	**Region**	**Estimated July 2009 Population**	**2009 Percent Uninsured**	**Estimated Number Uninsured**	**Estimated July 2009 Population**	**2009 Percent Uninsured**	**Estimated Number Uninsured**
Caldwell	8	2,446	4.0%	97	6,500	32.2%	2,096
East Carroll	8	2,270	3.4%	77	4,722	41.2%	1,944
Franklin	8	5,178	3.1%	158	11,335	32.9%	3,729
Jackson	8	3,692	3.8%	142	8,807	28.4%	2,505
Lincoln	8	11,814	5.4%	643	26,226	30.6%	8,037
Madison	8	3,418	3.5%	118	6,641	36.5%	2,422
Morehouse	8	7,233	3.1%	224	16,434	34.9%	5,733
Ouachita	8	42,671	4.1%	1,767	89,965	26.8%	24,121
Richland	8	5,432	3.3%	177	12,050	31.1%	3,751
Tensas	8	1,356	5.5%	75	3,401	37.6%	1,280
Union	8	5,736	5.0%	288	13,065	29.5%	3,860
West Carroll	8	2,645	2.4%	63	6,680	35.2%	2,352
Livingston	9	34,991	3.7%	1,281	77,016	16.1%	12,425
St. Helena	9	2,662	6.3%	168	6,488	33.5%	2,171
St. Tammany	9	62,188	3.2%	2,003	142,220	11.6%	16,440
Tangipahoa	9	33,622	3.9%	1,321	72,009	22.4%	16,123
Washington	9	12,276	5.6%	682	27,001	28.3%	7,633

Appendix A: Comparison of December 2009 Forecast to Previous Estimates

Table A.1: Comparison of December 2009 Forecasts to Past Estimates of Uninsured Children

Parish	Region	Jul-09	Dec-09
Jefferson	1	5.1%	6.2%
Orleans	1	7.9%	8.7%
Plaquemines	1	7.5%	8.7%
St. Bernard	1	5.5%	8.1%
Ascension	2	3.4%	3.8%
East Baton Rouge	2	4.7%	4.9%
East Feliciana	2	5.6%	6.2%
Iberville	2	4.0%	4.7%
Pointe Coupee	2	3.0%	4.3%
West Baton Rouge	2	4.6%	4.9%
West Feliciana	2	5.1%	4.5%
Assumption	3	3.3%	3.8%
Lafourche	3	3.7%	3.9%
St. Charles	3	1.8%	2.6%
St. James	3	4.5%	4.4%
St. John The Baptist	3	5.6%	5.9%
St. Mary	3	5.8%	5.0%
Terrebonne	3	6.3%	5.9%
Acadia	4	3.7%	4.0%
Evangeline	4	3.4%	4.0%
Iberia	4	4.0%	4.2%
Lafayette	4	3.7%	4.1%
St. Landry	4	3.6%	4.1%
St. Martin	4	5.3%	5.0%
Vermilion	4	4.9%	4.6%
Allen	5	6.7%	6.8%
Beauregard	5	5.3%	5.9%
Calcasieu	5	5.0%	5.4%
Cameron	5	7.0%	7.7%
Jefferson Davis	5	10.5%	9.1%
Avoyelles	6	7.9%	7.1%
Catahoula	6	5.2%	5.2%
Concordia	6	7.9%	6.4%
Grant	6	9.0%	7.4%
La Salle	6	3.9%	4.2%
Rapides	6	5.0%	5.1%
Vernon	6	4.0%	5.0%
Winn	6	11.5%	8.4%

Table A.1 (continued): Comparison of December 2009 Forecasts to Past Estimates of Uninsured Children

Parish	Region	Jul-09	Dec-09
Bienville	7	5.8%	5.6%
Bossier	7	9.3%	8.1%
Caddo	7	4.8%	4.9%
Claiborne	7	5.8%	5.8%
De Soto	7	4.7%	5.1%
Natchitoches	7	5.5%	5.7%
Red River	7	7.3%	7.1%
Sabine	7	8.9%	7.7%
Webster	7	6.5%	5.7%
Caldwell	8	4.1%	4.0%
East Carroll	8	3.3%	3.4%
Franklin	8	2.4%	3.1%
Jackson	8	3.7%	3.8%
Lincoln	8	6.2%	5.4%
Madison	8	2.7%	3.5%
Morehouse	8	2.6%	3.1%
Ouachita	8	4.3%	4.1%
Richland	8	2.7%	3.3%
Tensas	8	6.7%	5.5%
Union	8	5.1%	5.0%
West Carroll	8	2.2%	2.4%
Livingston	9	3.4%	3.7%
St. Helena	9	5.1%	6.3%
St. Tammany	9	2.8%	3.2%
Tangipahoa	9	3.5%	3.9%
Washington	9	5.2%	5.6%

Table A.2: Comparison of December 2009 Forecasts to Past Estimates of Uninsured Adults

Parish	Region	Jul-09	Dec-09
Jefferson	1	17.1%	17.9%
Orleans	1	21.4%	22.5%
Plaquemines	1	26.8%	25.8%
St. Bernard	1	29.9%	28.2%
Ascension	2	16.8%	16.4%
East Baton Rouge	2	16.4%	16.9%
East Feliciana	2	22.1%	23.1%
Iberville	2	18.5%	20.6%
Pointe Coupee	2	17.5%	19.5%
West Baton Rouge	2	15.3%	16.8%
West Feliciana	2	17.5%	17.8%
Assumption	3	21.3%	22.2%
Lafourche	3	14.3%	15.7%
St. Charles	3	13.3%	14.8%
St. James	3	24.8%	25.2%
St. John The Baptist	3	22.0%	24.3%
St. Mary	3	25.5%	25.5%
Terrebonne	3	17.8%	18.7%
Acadia	4	25.0%	25.1%
Evangeline	4	22.6%	24.2%
Iberia	4	20.3%	21.6%
Lafayette	4	14.9%	15.9%
St. Landry	4	20.0%	22.0%
St. Martin	4	22.6%	23.5%
Vermilion	4	18.7%	19.8%
Allen	5	21.4%	23.8%
Beauregard	5	18.9%	20.4%
Calcasieu	5	19.9%	20.6%
Cameron	5	18.7%	20.2%
Jefferson Davis	5	21.7%	22.8%
Avoyelles	6	23.6%	25.4%
Catahoula	6	30.5%	30.3%
Concordia	6	29.4%	29.6%
Grant	6	26.3%	26.4%
La Salle	6	20.6%	21.6%
Rapides	6	21.3%	22.3%
Vernon	6	14.9%	17.9%
Winn	6	28.7%	28.9%

Table A.2 (continued): Comparison of December 2009 Forecasts to Past Estimates of Uninsured Adults

Parish	Region	Jul-09	Dec-09
Bienville	7	32.6%	31.8%
Bossier	7	20.3%	21.0%
Caddo	7	25.0%	25.6%
Claiborne	7	24.0%	26.7%
De Soto	7	26.9%	27.6%
Natchitoches	7	24.6%	26.4%
Red River	7	34.0%	34.0%
Sabine	7	27.6%	28.1%
Webster	7	28.2%	28.0%
Caldwell	8	32.4%	32.2%
East Carroll	8	41.4%	41.2%
Franklin	8	31.7%	32.9%
Jackson	8	27.8%	28.4%
Lincoln	8	30.7%	30.6%
Madison	8	35.7%	36.5%
Morehouse	8	34.4%	34.9%
Ouachita	8	25.6%	26.8%
Richland	8	29.8%	31.1%
Tensas	8	36.9%	37.6%
Union	8	27.8%	29.5%
West Carroll	8	35.9%	35.2%
Livingston	9	14.6%	16.1%
St. Helena	9	32.0%	33.5%
St. Tammany	9	10.4%	11.6%
Tangipahoa	9	20.8%	22.4%
Washington	9	26.7%	28.3%

Appendix B: Technical Appendix

Construction of Synthetic Estimates

Our methodology consists of constructing synthetic estimates of parish uninsured rates similar to:

$$\hat{y}_i^{Synthetic} = \hat{\beta}_0 + \hat{\beta}_1 x_{1i} + \hat{\beta}_2 x_{2i} + \ldots + \hat{\beta}_k x_{ki}$$

Intuitively, the methodology should use the survey estimate y_i^{Direct} when the survey estimate is accurate and $y_i^{Synthetic}$ when the survey standard error is large and y_i^{Direct} is inaccurate. We accomplish this goal by creating a blended estimate:

$$y_i^{Blended} = w_1 y_i^{Direct} + w_2 y_i^{Synthetic}$$

where $w_1 = 1 - \frac{Var(Y^{Direct})}{(Var(Y^{Direct}) + Var(Y^{Synthetic}))}$ and

$$w_2 = \frac{k * Var(Y^{Direct})}{(Var(Y^{Direct}) + Var(Y^{Synthetic}))}.$$[1]

For the children's model, the independent variable is equal to the child's probability of being uninsured. For many children, this is simply zero or one depending on the survey response. But, for children who are eligible for Medicaid, the bias correction model was used to assign a probability of being on Medicaid based on the individual and family characteristics. The explanatory variables are the percent of working age adults in the house who are unemployed, an indicator equal to one if the child lives in a family below 185% of the federal poverty line, household income, an indicator equal to one if the child is black, an indicator equal to one if the child is female, an indicator equal to one if the child is on Medicaid or LaCHIP, three indicator variables for age category, and indicator variables for DHH region. Note that we constrain the coefficients of the 185% of poverty indicator and Medicaid control to sum to zero. For the December 2009 forecast, multiple years of the LHIS were used for the first time in order to better estimate the relationships between these explanatory variables and insurance coverage. Therefore, controls for year of LHIS were added as were interactions between the year controls and labor market characteristics. This assumes that the relationship between demographics and insurance doesn't change over time, but the relationship between employment and insurance does. This additional flexibility relative to the labor market was allowed because of the dramatic changes in the labor market over this period due the effects of hurricane Katrina.

The adult model is similar in spirit to the child model, but with some notable differences. As in 2007, the adult equation deletes the Medicaid indicator. However, several new controls have been added

[1] Note that this weighting scheme differs from the pure empirical Bayes used in the 2003 LHIS and tends to place more weight on direct estimates for our sample. We thank Gestur Davidson of SHADAC for suggesting the new weights.

to allow for more flexible relationships between the explanatory variables and the probability of being uninsured. New variables include squared terms of the unemployment rate and income and interactions of those terms as well as interactions of the income terms and the 185 percent poverty indicator. In addition, an interaction was introduced between the unemployment rate and the female indicator variable because insurance coverage may be less closely tied to employment for women than for men. Finally, interactions between age and gender were added to allow the effects of age to differ by gender.

Overall results appear as expected. Uninsured rates are higher among poorer individuals and among the unemployed. Given the sample sizes, we have more confidence in the regional estimates and scaled the parish-level estimates so that the regional totals match those from the full report. This process of scaling the parish estimates to equal regional estimates is called raking the estimates and ensures consistency across reports. For the purposes of forecasting, the same raking ratios were used as in the original 2009 parish-level estimates to ensure consistent adjustments to the parish model.